SMOKE TESTING PROCEDURES
LOW LEVEL SEWERSHED
BALTIMORE CITY PROJECT 1029

The information contained in this manual is not intended to address or account for all situations or circumstances encountered, rather it provides the user with general guidelines of the procedures to be followed for Smoke Testing in the Low Level Sewershed.

HAZEN AND SAWYER
Environmental Engineers & Scientists
PHR+A
Hatch Mott MacDonald

Smoke Testing Sewers

Smoke testing is a cost effective method of locating system defects and sources of inflow and infiltration (I/I) in piped conveyance systems.

The principal problems that will be identified by smoke testing include:

- Cracked or broken sewer pipes
- Missing or broken cleanouts
- Leaking manholes
- Illicit connections to sanitary sewers (roof drains, yard drains, etc.)
- Cross-connections between storm and sanitary sewers

These problems lead to Inflow and Infiltration in the collection system. Inflow and infiltration or I/I are terms used to describe the ways that groundwater and storm water enter into dedicated sanitary sewer collection systems. Dedicated sanitary sewers are pipes located in the street or in easements that are designed strictly to transport wastewater from sanitary fixtures inside your house or place of business. Sanitary fixtures include toilets, sinks, bathtubs, showers and lavatories.

Inflow is stormwater that enters into sanitary sewer systems at points of direct connection to the systems. Various sources contribute to the inflow, including footing/foundation drains, roof drains or leaders, downspouts, drains from window wells, outdoor basement stairwells, drains from driveways, groundwater/basement sump pumps and even streams. These sources are typically improperly or illegally connected to sanitary sewer systems, via either direct connections or through discharge into sinks or tubs that are directly connected to the sewer system. An improper connection lets water from sources other than sanitary fixtures and drains enter the sanitary sewer system.

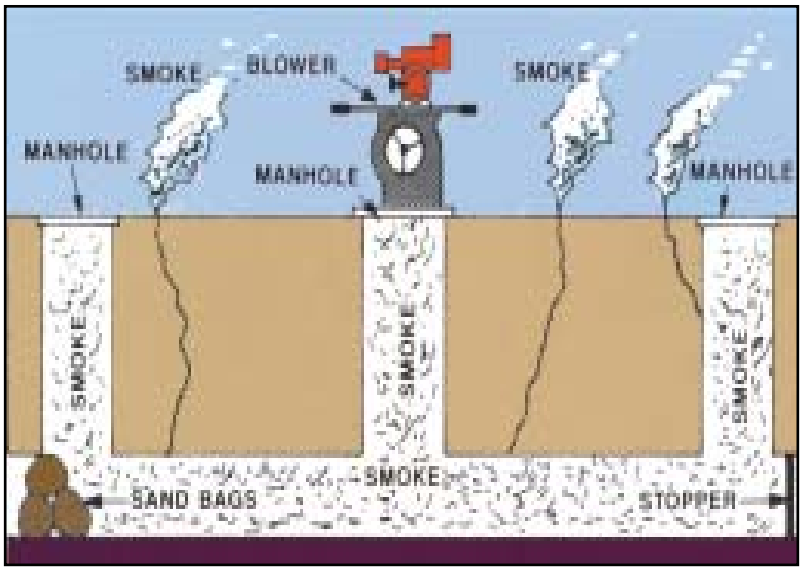
Infiltration is groundwater that enters sanitary sewer systems through cracks and/or leaks in the sanitary sewer pipes. Cracks or leaks in sanitary sewer pipes or manholes may be caused by age related deterioration, loose joints, poor design, installation or maintenance errors, damage or root intrusion. Groundwater can enter into the collection system wherever sanitary sewer systems are located beneath an areas water table or when the soil above the sewer systems becomes saturated.

Inflow and infiltration water is typically called “clear water” (although it may be dirty) to distinguish it from normal sanitary sewage in the collection system.

Smoke Testing Procedures

Best results for smoke testing are obtained on dry days when the ground is not saturated or frozen and when water is not leaking into the sewer. Testing shall not be conducted when the ground is wet or frozen.
Smoke tests are typically effective regardless of surface, type of soil, or depth, provided openings exist for the smoke to follow to the grounds surface. For example is not uncommon to see smoke exiting from cracks in paved surfaces, showing points of surface water entry into the collection system.

As illustrated below, usually two sections of sewer (600-1000 ft.) are tested simultaneously, with test durations no longer than approximately 15-20 minutes. Trying to smoke test more than two sections at a time makes it difficult for workers to thoroughly inspect the entire area of the test in the limited time that the smoke is visible to identify defects.



The Smoke Testing process begins by placing a blower over a centrally located manhole and forcing a non-toxic, odorless smoke, into a designated segment of the sewer.

Blocking the far side of the upstream and downstream manholes is necessary when isolating a section of sewer. Once the smoke is injected, a large blower, or fan, forces the smoke through the pipe. The smoke, under pressure will fill the main line plus any connections, then follow the path of any leaks to the ground's surface, quickly revealing the source of any defects.
In most instances, smoke will flow from the roof vents of buildings in less than a minute, which is normal in correctly functioning system. During the tests, the crew should check buildings, surrounding grounds and streets for telltale signs of smoke and accurately record these locations.

Smokes coming from the roof vent

Smoke coming from a defective manhole

The smoke will also be noticeable wherever there is a leak or defect in a sanitary sewer pipe, such as a crack, a cross-connection between a storm sewer and a sanitary sewer, where a roof drain is connected to the sanitary sewer, from a broken or missing cleanout cap, or from a defective or damaged manhole. Invariably, the fault will be found along the sewers alignment or within a few feet from the point where smoke is visible. Smoke immediately backing up into the blower indicates a possible line blockage. If this should occur, testing should be discontinued and the City notified immediately, of a potential line blockage.

Smokes coming from a storm drain

Smoke coming from main sewer pipe

Smoke coming from a broken cleanout cap center

Although smoke testing can be done with just two workmen, a crew of three usually is more efficient. One person initiates the test and watches over the blower and the other two quickly check the buildings, grounds, and streets in the area for signs of smoke. These workers should be provided with marking paint or flags for marking the locations of smoke coming from lawns, pavement cracks or other defect locations. They should also be provided with a record form on a clip board for making a written record of all smoking roof drains, yard drains, defects or other signs of smoke. Photographs clearly showing the location of the smoke, and photograph reference number should be obtained at each defect before the smoke has dissipated.

Crew filling out smoke testing forms, flag identifies location of smoke observed during the test.

Inspector video taping smoke/ defect location

All observations and source defects identified during each test shall be photographed and/or video taped to accurately define leak locations. The pictures can also be helpful in convincing property owners that they have a defect. Include addresses and specific locations of any defects in the photographs or videos for a way to verify the accompanying written documentation. Inspection crews should carry display boards to write a location reference and photograph number and place it where it can be seen when the picture is taken.

Inspector using flags to locate smoke during the test

Example of smoke/ defect location test photograph

Smoke Testing Preparation

Smoke tests may involve many hours of labor, have the potential to affect the occupants of buildings connected to the collection system being tested and, disrupt traffic. Thus, the key to efficient smoke testing is to have the work well planned in advance. An experienced smoke testing crew can test up to 10,000 ft of sewer in an 8-hour day if the work has been well laid out. **A map of the sewer system to be tested showing all manholes and sewer pipe details is essential** and it will save time later when recording information from the smoke tests if the manholes are numbered.

The sewer lines, manholes, and the direction of flow should be shown on the map making it easier to determine how many buildings are connected to each section of sewer. This map will also make it easier to identify problem areas when recording notes during the test.

Manholes to be used for blower placement should be predetermined and accessed prior to commencing the test. When identifying which manholes will be used for installation of the blower, try to avoid busy intersections. The safety of both the crew and the public must be considered at each setup. If the manholes to be opened are in the street, it will be necessary to have appropriate signs and barricades available to control traffic. Each smoke testing crew shall set-up the ''Smoke Testing in Progress'' signs provided and provide the necessary traffic and pedestrian controls and any permits required.

Smoke Testing Sign

When it is necessary to work in manholes on busy streets, it may be necessary to have two or more additional workers on the crew to help move barricades and direct traffic. All workers should wear approved safety vests at all times, both to alert drivers when they are in the street, and to make it clear to the public that

they are part of the test crew when they must enter private property. Each smoke testing subcontractor is responsible for providing maintenance of traffic and any permits required to complete their work.

It will save time when conducting the smoke test if a crew goes around in advance and checks the covers on all manholes that are to be opened to make sure they can be easily removed. At the same time, they can make a quick inspection for unusually heavy flow or other problems that should be repaired or investigated before the smoke test. They can also verify information on the drawings, such as sewer pipe sizes and direction of flow to prevent delays when the tests are being conducted.

Advance Notice to the Public

It is essential that all municipal departments be aware of when and where the smoke testing will be conducted. The Fire Department, Police Department, 311, and the City are all likely to receive calls in spite of all efforts to fully inform the public in advance. The residents in the areas to be smoke tested must be informed of the testing, why it is being performed, what they might see during the test, what they should do in advance of the test, and what to do if smoke enters their house. Advance notification also allows anybody with special requirements such as health concerns enough time to inform you of their situation so that the necessary arrangements can be made. The smoke testing contractor is responsible for delivering the smoke testing notifications and door hangers well in advance of the testing. These requirements are outlined later in this manual.

Before commencing work each day, make sure to provide the JV with test location information. A template is provided below and should be sent to the JV the day before the tests are scheduled.

Template for Daily Notification:

The locations scheduled for testing on (insert DATE) includes:

Map Number:
Crew NAME
Test sections:
4205-4219 Erdman Ave
4217-4309 Erdman Ave
4301-4311 Erdman Ave

Sites scheduled for testing are highlighted in red on the attached maps. We anticipate beginning work at 8:00 a.m. and ending no later than 5:00 p.m. You may contact the team crew leaders, NAME at XXX-XXX-XXXX for CREW XX if you have questions.

If you have any questions regarding the smoke testing program, please contact NAME.

Concluding a Smoke Test

All of the notes, pictures and findings that are accumulated in the field during the test should be put into a comprehensive report summarizing the smoke testing work, for each segment of the sewer.

All pictures shall be in digital jpeg formats and stored using the approved naming convention on hard drives or CD-R discs; DVD-R's are not to be used as they are not universal. All video are to be in MPEG 1 format and stored using the approved naming convention on hard drives or CD-R discs; DVD-R's are not to be used as they are not universal.

All data entries on the smoke testing forms shall be complete. Sketches shall be neat and all data is expected to be legible and clear. If any data (maps) given to the sub-consultant are incorrect or not included, the sub-consultant will be expected to make note of any observations including unidentified manholes, non-existent manholes, new pipe segments, abandoned pipe segments, incorrect flow arrows and any other observations that would be important to the consultant to correctly update the maps.

All data including forms, discs, etc…. shall be handed in weekly by the sub-consultant. Each sub-consultant shall review all data before it is submitted to eliminate questionable, illegible or incorrect data.

Initially, work will be suspended a week after the first submittal of data. This time will be used to review the submission and iron out any wrinkles in the collection of data to ensure that data is being collected correctly. If at any time the submitted data is questionable, incomplete or illegible, the sub-consultant will be asked to verify and correct the data.

If the sub-consultant finds any issues of immediate concern, the JV should be notified immediately.

Any defects or maintenance issues identified that require immediate attention shall be classified into one of two classifications as follows:

1) Emergency - any extreme defect such as a collapsed pipe segment, major structural defects of a manhole or pipe segment, missing manhole covers as well as any other possible serious defect scenarios which may present a hazardous or dangerous situation, or could lead to a possible sewer discharge. 2) Priority - any issue that should be addressed in order to prevent it from turning into an emergency priority. Issues or defects include heavy roots, heavy grease, active surcharge, or any other similar situation.

A location map shall be prepared along with any available field data including photographs and any other useful information to identify and locate the problem. All information, including photographs and any defects should be collected in such a way so they can be imported into the clients GIS system.

Example of notification process

Smoke Testing Notification Protocol:

Notifications Made by the JV: City Police Department, City Fire Department, Local Fire Department, 311, Local Agencies, Local Officials had been informed by the Consultant that over the next few months, weather permitting, the JV's Subconsultants will be conducting smoke testing in various areas of the Low Level Sewershed.

Notifications to be made by the Subconsultants:

- **Two to Four weeks** prior to testing a location, the Subconsultant must distribute door to door **Smoke Testing Flyers and FAQ's** to the Residents/Owners of business within a 2 block radius of the test location. (Examples are provided on the following pages).
- **Two to Three days** before testing begins the Subconsultant must place **door-hangers** on the door of each resident/business directly involved or adjacent to areas being tested (Example is included on the following page).

Flyers and Door hangers will provided to the subconsultants.

The day prior to commencing the smoke testing, subconsultant must send an email to the JV with a plan of the next days testing activities, showing the area to be tested and crew contact information.

Smoke testing forms to be completed by subconsultants during each test.

The forms shown on the pages 11 to 14 are examples of properly filled out smoke testing forms and photographic records, and that would also be the format of the pdf file the subconsultant needs to submit along with the data base.

Page 1, the map/sketch sheet must show: All Manholes with numbers, Blower Placement Location, Sandbag or Isolation Locations, Street Names, Building Addresses and Locations, Defect Locations and Photograph Numbers, Segment Lengths and any other information the field technicians consider important to the test.

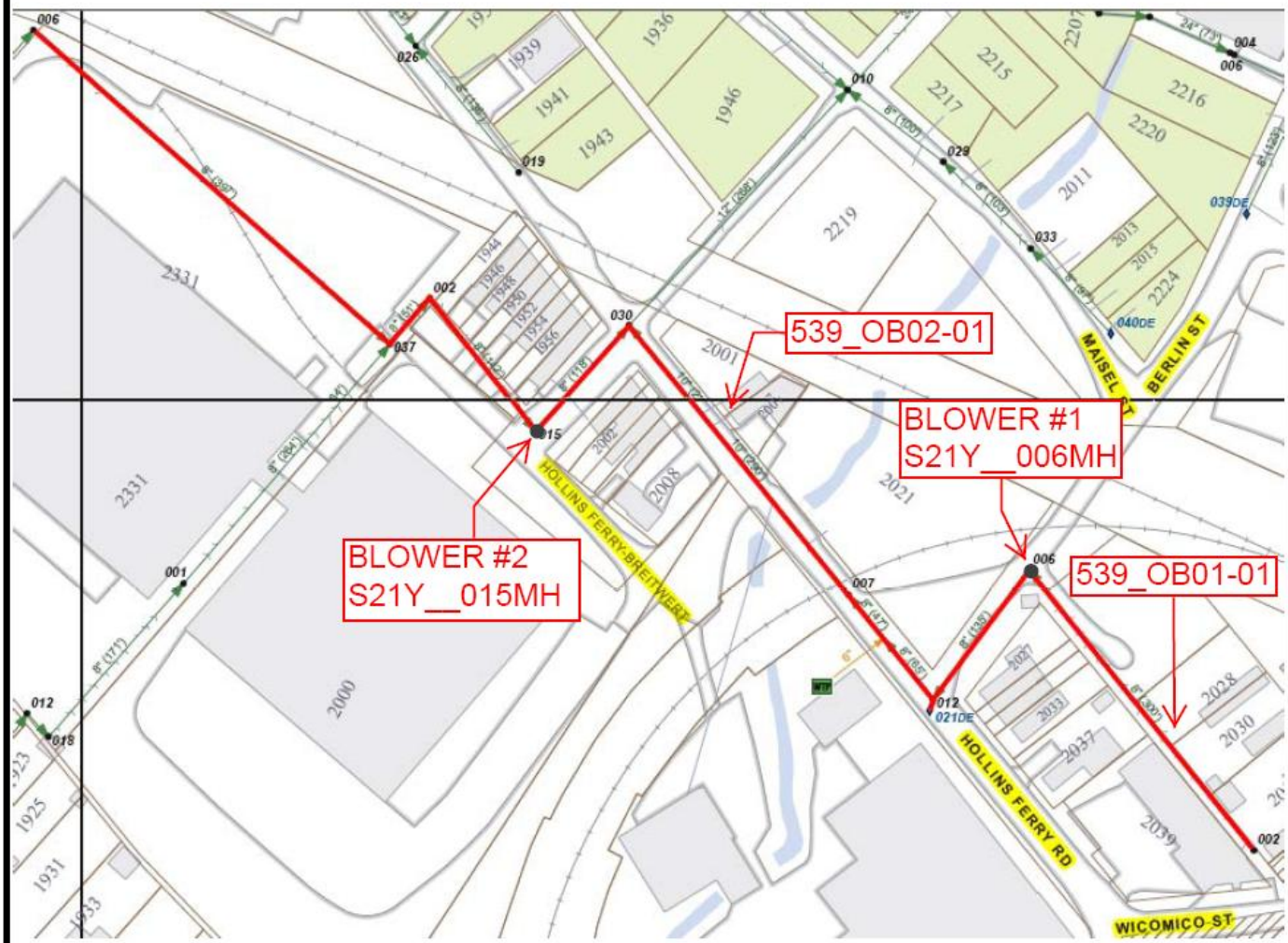
The second page shall provide more detail about the defect locations identified on the map/sketch (page 1) and reference the associated photograph number.

All of the notes, pictures and findings that are accumulated in the field should be put into a comprehensive report summarizing the smoke testing work. The same comprehensive report will be loaded into an Access database created for this purpose.
Hard data that passes the QA/QC process will be organized and stored by the subconsultant in an Access database. All the information collected shall be submitted to the JV in both paper and electronic form.

In the pages that follow you will find the **Users Guide and Administrator's Manual for The Smoke & Dye testing database a Microsoft Access 2000** database designed to facilitate the population of smoke and dye testing, observations, and observation photograph records according to the database schema and specifications outlined in the BaSES document, Smoke and Dyed Water Testing (Appendix 6-6).

CITY OF BALTIMORE WET WEATHER CONSENT DECREE SMOKE AND DYED WATER TESTING FORM		Page 1 of 4
Sewershed: Low Level Subsewershed: 42	Company: REI/DRAYCO	Date: 08/12/2008
Test Type: Smoke	Ground Condition: Dry: **X** Damp: _ Wet: _	Supervisor: E.R. Crew: 04
Manhole ID: S21Y__006MH	Test ID: 1029-539	Notifications Made: __X__ Residents, Fire, 311

Field Sketch: (Show all manholes with numbers, blower placement location, sandbag or isolation locations, street names, building addresses and locations, defect locations and photograph numbers)



CITY OF BALTIMORE WET WEATHER CONSENT DECREE SMOKE AND DYED WATER TESTING FORM		Page 2 of 4
Sewershed: Low Level Subsewershed: 42	Company: REI/DRAYCO	Date: 08/12/2008
Test Type: Smoke	Ground Condition: Dry: **X** Damp:_ Wet:_	Supervisor: E.R. Crew: 04
Manhole ID: S21Y__006MH	Test ID: 1029-539	Notifications Made: __X__ Residents, Fire, 311

Field Sketch: (Show all manholes with numbers, blower placement location, sandbag or isolation locations, street names, building addresses and locations, defect locations and photograph numbers)

Defect No.	Address	Source Type	Location	Sector	Drainage Area	Severity	Photo Number
1	2028 MAISEL ST.	03	08	02	0	3	1029-539_OB01-01.jpg
2	2005 HOLLINS FERRY RD.	09	14	02	0	3	1029-539_OB02-01.jpg

OBSERVATION CODES

Source Type				Location				Sector		Severity	
01	Main Sewer	10	MH Frame	01	Paved Conc.	10	Non-Paved	01	Public	01	No Smoke
02	Service Line	11	Storm Drain	02	Asphalt	11	Field/Woods	02	Private	02	Trace
03	Cleanout	12	Catch Basin	03	Paved Other	12	Alley			03	Moderate
04	Downspout	13	Storm MH	04	Driveway	13	Golf Course			04	Major
05	Area Drain	14	Storm Ditch	05	Sidewalk	14	Other				
06	Dwy. Drain	15	Excavation	06	Curb						
07	Stair. Drain	16	Water Line	07	Yard - Front						
08	Found. Drai	17	Tele. Pole	08	Yard - Back						
09	Bldg. Interio	18	Other	09	Yard - Side						

CITY OF BALTIMORE
SMOKE TESTING OBSERVATION SUMMARY
LOW LEVEL SEWERSHED
BALTIMORE CITY PROJECT 1029
REI/DRAYCO

Unique Test ID: 539	Date: 08/12/2008	Basin: LL - 42	Manhole ID: S21Y__006MH
Defect No: OB01	Supervisor: E.R. Crew: 04		Dye Test Recommended: N
Location: 2028 MAISEL ST.			
Source Type: 03 Cleanout		Location: 08 Yard - Back	
Sector: 02 Private		Severity: 03 Moderate	Drainage Area: 0

Comments: SMOKE COMING FROM ABOVE GRADE CLEANOUT IN BACK YARD.

SMOKE TEST PHOTOGRAPHS

Photograph No: OB01-01
Filename: 1029-539_OB01-01.jpg

CITY OF BALTIMORE
SMOKE TESTING OBSERVATION SUMMARY
LOW LEVEL SEWERSHED
BALTIMORE CITY PROJECT 1029
REI/DRAYCO

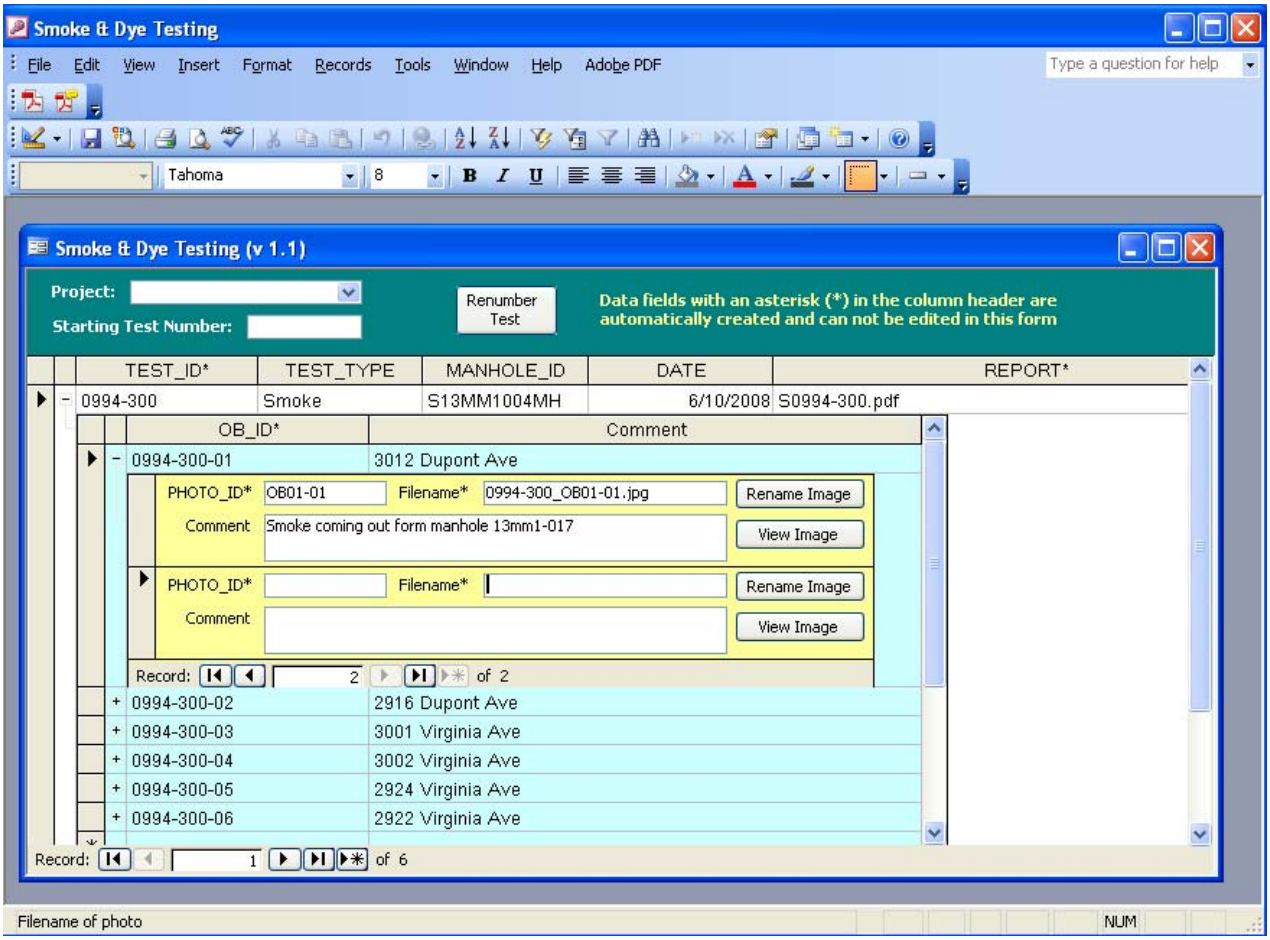
Unique Test ID: 539	Date: 08/12/2008	Basin: LL - 42	Manhole ID: S21Y__006MH
Defect No: OB02	Supervisor: E.R. Crew: 04		Dye Test Recommended: N
Location: 2005 HOLLINS FERRY RD.			
Source Type: 09 Building Interio		Location: 14 Other	
Sector: 02 Private		Severity: 03 Moderate	Drainage Area: 0

Comments: SMOKE COMING FROM INTERIOR OF BUILDING AT ADDRESS.

SMOKE TEST PHOTOGRAPHS

Photograph No: OB02-01
Filename: 1029-539_OB02-01.jpg

The picture below illustrates the data for the example demonstrated earlier, with the data loaded on the access database. As mentioned in the previous pages the subcontractor after the field work needs to load all the information collected during the test into the Access database. The Users guide administrator's manual in the pages that follow, has all the information needed to organize the field data and photographs on the access database created for this purpose.



Data base user form: Observation Records

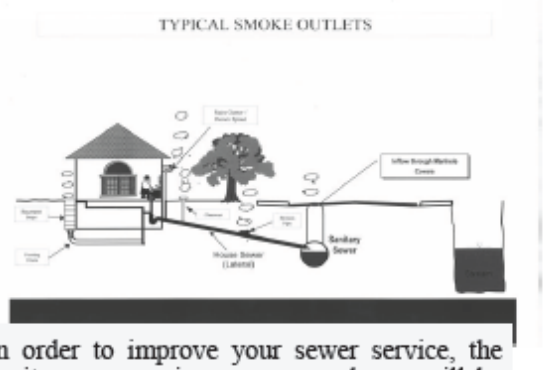
SMOKE TESTING DOOR HANGER NOTIFICATION
(TO BE DELIVERED BY SMOKE TESTING CONTRACTOR TWO-THREE DAYS PRIOR TO TESTING)

Front and back of Smoke Testing Flyer

PLEASE READ

Notice to All Residence

Baltimore City Is Doing Smoke Testing



In order to improve your sewer service, the sanitary sewer pipes near your home will be inspected for possible leaks by means of smoke testing.

Smoke testing can help locate defective connections that home/business owner or occupants may not know exist.

The smoke testing will take place over the next 3-5 days with work scheduled to begin each day at 9:00 a.m. and end no later than 5:00 p.m.

The test will be conducted by ADS Environmental Services, REI/Drayco or Savin Engineers under contract with the Baltimore City Department of Public Works (DPW).

During the smoke test, workers will force a HARMLESS, NON-TOXIC FOG into the sewers in your area to locate system defects. This fog, which resembles smoke, is safe and disappears quickly once doors or windows in your home are open for a short time following this occurrence.

(Turn Over For More Information)

To prepare for smoke testing, pour a cup or more of water into each floor drain and sink drain or run the faucet for a few minutes the night prior to smoke testing.

If someone in your home/business is homebound or has a respiratory condition, please call the Jones Falls Sewershed smoke testing hotline at 410-462-9411 or Samuel Edoror at the Baltimore City Department of Public Works (410)-396-3440, between the hours of 8:00 a.m. – 4:30 p.m. and leave your name, address and phone number so that a supervisor may contact you prior to testing to further discuss your situation and ensure the comfort and safety of yourself and other such persons.

During testing, smoke may enter your home/business through drains. Smoke may escape from the vent pipe on the roof of your home/business, which is normal. **Smoke may enter your home/business if your plumbing is not in proper operating condition due to defects or your sink/floor drain traps do not have water in them.** If traces of smoke are detected in your home/business, there is a possibility that lethal or explosive gases from the sewer system could also be entering the building. If this situation occurs, the City of Baltimore strongly advises you to contact a licensed plumber as soon as possible to check for faulty plumbing fixtures and take appropriate measures to repair defects.

If smoke enters your home/business, open windows for ventilation and the smoke should disappear quickly. **Please contact the crew manager working in your area to let them know smoke has entered your home/business** Maria Bulley 410-462-9225. Personnel will be available to assist you in locating the source of the smoke.

If you have additional questions, please call the Jones Falls smoke testing hotline at 410-462-9411 or the Baltimore City Department of Public Works, Project Manager Samuel Edoror, at (410)-396-3440 between 8:00 a.m. - 4:30 p.m. or 311 after hours.

SMOKE TESTING FLYER
(TO BE DELIVERED BY SMOKE TESTING CONTRACTOR TWO-FOUR WEEKS PRIOR TO TESTING)

CITY OF BALTIMORE
SHEILA DIXON, Mayor

DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND WASTEWATER

June, 2008

Smoke Testing Flyer

Dear Baltimore City Resident:

To improve our sewer system, the City of Baltimore, Department of Public Works has contracted H&S/PHR+A/HMM to conduct smoke testing during the months of July-August. The testing is necessary to locate defects in the sanitary sewers in your neighborhood. The investigation is part of a city-wide program in compliance with the City's Consent Decree entered into with the United States Environmental Protection Agency (USEPA) and the Maryland Department of Environment (MDE) to repair Baltimore City's sewer system and reduce wastewater overflow into the Chesapeake Bay and its tributaries. Your cooperation and understanding are appreciated while this important work is undertaken.

Smoke Testing involves introducing smoke into the sewer system and observing the locations where the smoke escapes. The smoke escapes from sewer defects where rainwater or groundwater can enter. To reduce sewer flow, these defects must be identified, located and repaired. If the plumbing in your house is in proper condition, the smoke will not escape into your home. However, if you do have any plumbing problems, smoke will escape from any defective pipes.

To ensure your plumbing (i.e. sinks, shower stalls, etc.), and inside floor drains are properly sealed prior to the smoke test, pour a bucket of water in each drain to fill the trap so that no smoke escapes from the drains. During the test, it is normal for smoke to escape from the vent pipe through the roof of your home and this should cause no alarm.

The smoke used in this test is not harmful to people, pets or furnishings. We respectfully request your assistance by notifying handicapped or homebound persons in your neighborhood of this test.

A reminder door hanger will be distributed a few days prior to the Smoke Test. It is not necessary for you to be home during the inspection. However, the inspectors may need to walk onto your property to look for signs of smoke coming from area drains, downspouts or the ground.

If you have any questions or observe smoke escaping from any place other than the roof vent pipes, please notify one of the field personnel conducting the test. If you have any questions regarding the smoke testing program, please contact the City of Baltimore's Project Manager Mr. Samuel Edoror at 410-396-3440 between the hours of 8:30 am - 4:30 pm or if immediate attention is required after hours please call the City's 311 assistance number. Please refer to the attached Frequently Asked Questions for further information.

CITY OF BALTIMORE
SHEILA DIXON, Mayor

DEPARTMENT OF PUBLIC WORKS
BUREAU OF WATER AND

Smoke Testing
Frequently Asked Questions

In order to improve your sewer service, the sanitary sewer pipes near your home will be inspected for possible water leaks by means of smoke testing.

Smoke testing can help locate defective connections that home/business owners or occupants may not know exist.

The tests will be conducted by H&S/PHR+A/HMM, under contract with the Baltimore City Department of Public Works (DPW). Note, smoke testing will not be done during or immediately after rain storms because smoke will not travel through water-soaked ground.

Below are frequently asked questions about the process. If you have additional questions, please call the Baltimore City Department of Public Works Project Manager, Mr. Samuel Edoror at (410) 396-3440 between the hours of 8:30 am - 4:30 pm or if immediate attention is required after hours please call 311.

Q. What is smoke testing and why is it conducted?
A. Smoke testing is the process of using a gas-powered blower to force a harmless non-toxic fog, which resembles smoke, into the sanitary sewer lines to locate water leaks. The smoke will be noticeable wherever there is a leak in a sanitary sewer pipe. The City of Baltimore Department of Public Works is conducting smoke tests as part of an on-going program to detect leaks within the sewer collection system. Locating and correcting these problems will greatly reduce the possibility of sewage backups or overflows occurring.

Q. Is the smoke harmful?
A**. NO**. The smoke has a slight odor and may make you cough, but it is not harmful to people or pets. It will not damage your plants, clothing or furnishings. The smoke leaves no residue or stains.

Q. Will smoke come into my home/business and if so, what should I do?
A. Smoke **may** enter your home/business through drains - for example, washing machine drains. Smoke may also escape from the vent pipe on the roof of your home/business, which is normal. Smoke should exit the vent stacks of the surrounding properties within the testing area. ***Smoke may also enter your home/business if your plumbing is not in proper operating condition due to defects or because your sink/floor drain traps do not have water in them.*** If traces of smoke or its odor are detected in your home/business, there is a possibility that lethal or explosive gases from

the sewer system could also be entering the building at other times. Sewer gases can be dangerous, and some of these gases have no odor or color, and can enter a building undetected. If smoke from these tests does enter your home, Baltimore City Department of Public Works strongly advises you to contact a licensed plumber as soon as possible to check for faulty plumbing fixtures and take appropriate measures to repair defects.

If smoke enters your home/business, open windows for ventilation and the smoke should disappear quickly. Please identify and contact the crew working in the area to let them know smoke has entered your home/business. Personnel will be available to assist you in locating the source of the smoke. Please be certain to request and obtain proper identification from any city employee or contractor before allowing them to enter your home for further inspection.

Q. What should I do to prepare for smoke testing?
A. As the possibility exists for smoke to enter your home/business via a defect in the sewer pipes, it is recommended to prepare your home/business as much as possible so that 'normal' non-defective drains will not permit entry of smoke.

A drain trap, the S-shaped curvature in the pipe typically found under sinks, exists to 'trap' a level of water and block sewer gases from entering the home/business. To prepare for smoke testing, pour a small amount (more than a cup but less that a quart) of water into each floor and sink drain or simply run the faucet for a few minutes the night prior to smoke testing. This will fill the traps and block the smoke. A dry trap will be found in drains which are not used regularly such as basement and garage drains. This can allow smoke to enter the home/business. Note, the existence in your home/business of seldom used floor drains, bathrooms, and deep sinks for dry traps and run water into them. If a sink is left unused for a period of time, traps will normally dry out.

If someone in your home/business is homebound or has emphysema, asthma, or other respiratory conditions, please call 410-462-9411 smoke testing hotline or **Mr. Samuel Edoror** between 8:30 am – 4:30 pm at the **Baltimore City Department of Public Works (410) 396-3440** and leave your name, address and phone number so that a supervisor can contact you prior to testing to further discuss your situation and ensure the comfort and safety of yourself and other such persons.

Your cooperation is also requested in notifying disabled or homebound persons in your neighborhood of these tests.

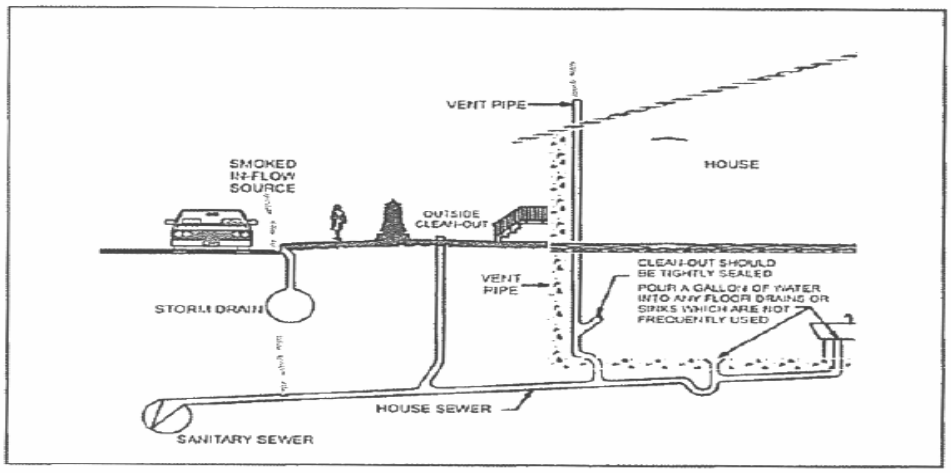
Q. I will not be at home during the smoke testing and have pets in the house. What should I do?
A. The smoke is not harmful to pets; however, leave several windows partially open for ventilation should any smoke enter the building. If you have proper connections and all of the traps have water in them, there should not be any problems.

Q. Will the City require me to fix the plumbing in my home or business if smoke enters the building?
A. Baltimore City will not require a property-owner to fix their plumbing unless the connection is considered an "illegal connection" as defined by the Baltimore City Code. Connections that allow groundwater or storm water to drain into the sanitary sewer system such as roof leaders and sump pumps are not permitted and will be reported to the appropriate City Agency for resolution.

However, the City urges property-owners to seek the assistance of a licensed plumber to repair faulty plumbing fixtures as the possibility exists of lethal or explosive sewer gases entering the building.

Q. Can the smoke block the sewers?
A. **No.** The smoke is actually a fog made up of a vaporous substance and cannot clog a sewer pipe.

Q What happens if the City finds a bad sewer?
A. This information will be documented and given to the Bureau of Water and Wastewater and the City of Baltimore will be obligated to determine what steps are necessary to remedy the problem.



SMOKE & DYED WATER TESTING – V07.01

Microsoft Access Database

Users Guide and Administrator's Manual

December 2007
Version 1.1

Table of Contents

Document History Table

Date	Version	Notes	Initials
12/3/2007	07.01	Initial release for BaSES	RK&K

Introduction

The Smoke & Dye testing database a Microsoft Access 2000 database is designed to facilitate the population of smoke and dye testing test, observations, and observation photos records according to the database schema and specifications outlined in version 07.02 of the **BaSES** document **Smoke and Dyed Water Testing** (Appendix 6-6). The database's forms automatically populate the record ID and filename fields leaving the user to focus on entering item specific information.

The following table lists the database tables and fields in the Smoke & Dyed Water Testing database along with additional information on how the application manages the field.

Table TEST		
Field	**Read-Only**	**Remark**
TEST_ID	Yes	Field is automatically populated when a new record is created
TEST_TYPE	No	User must select the type of test performed from a combo box.
MANHOLE_ID	No	User must enter the manhole ID. The application validates the manhole against the Baltimore wastewater manhole naming convention and informs the user if the entered ID is invalid.
DATE	No	User must enter the date of the test
REPORT	Yes	This field automatically populates as the record is saved
Table OBSERVATION		
Field	**Read-Only**	**Remark**
OB_ID	Yes	Field is automatically populated when a new record is created
TEST_ID	Yes	Field is automatically populated when a new record is created
OB_COMMENT	No	User supplied
Table PHOTO		

Field	Read-Only	Remark
PHOTO_ID	Yes	Field is automatically populated when a new record is created
OB_ID	Yes	Field is automatically populated when a new record is created
FILENAME	Yes	Field is automatically populated when a new record is created
PHOTO_COMMENT	No	User supplied

Opening the Database

When the database is opened, the main user form is automatically displayed as shown in **Error! Reference source not found.**. The form lists all the currently stored smoke and dyed water tests in the database.

Note: If the column header contains an asterisk, the field is automatically populated and managed by the application and can not be edited by the user

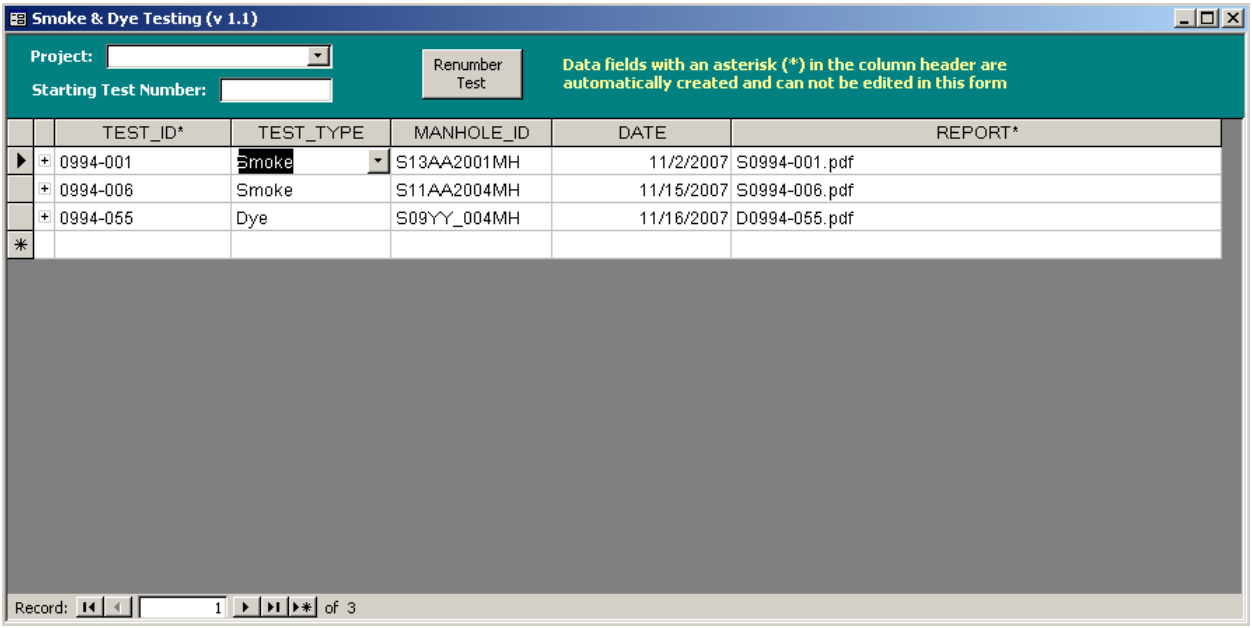


Figure 1 - Main database user form

Adding a Test to the Database

Before you may enter a new test to the database you must fill in the **Project** combo box and **Starting Test Number** textbox fields in the form's header.

Clicking the **Project** combo box will display a list of all the Baltimore City sewershed projects. Select the appropriate project.

In the **Starting Test Number** textbox enter the number from which the application will start assigning new test numbers. For a group of sequential tests, this control should only need to be set once. The application will start at this number and count upwards until it finds an unused test number.

With the above two controls set, you can begin entering data in any of the three user-editable fields: TEST_TYPE, MANHOLE_ID and DATE, on the row for a new

record. As soon as you begin typing, you will note that the application fills in the TEST_ID field. The Report field is filled in when the TEST record is saved.

Adding an Observation

Clicking the small plus sign on the left side of the TEST record will open a subdatasheet showing all observations for the specific test selected, as shown in Figure 2.

Note: The **Comment** field is the only user-editable field in the Observation subdatasheet.

To add a new observation, enter a comment, and the OB_ID field will automatically be populated.

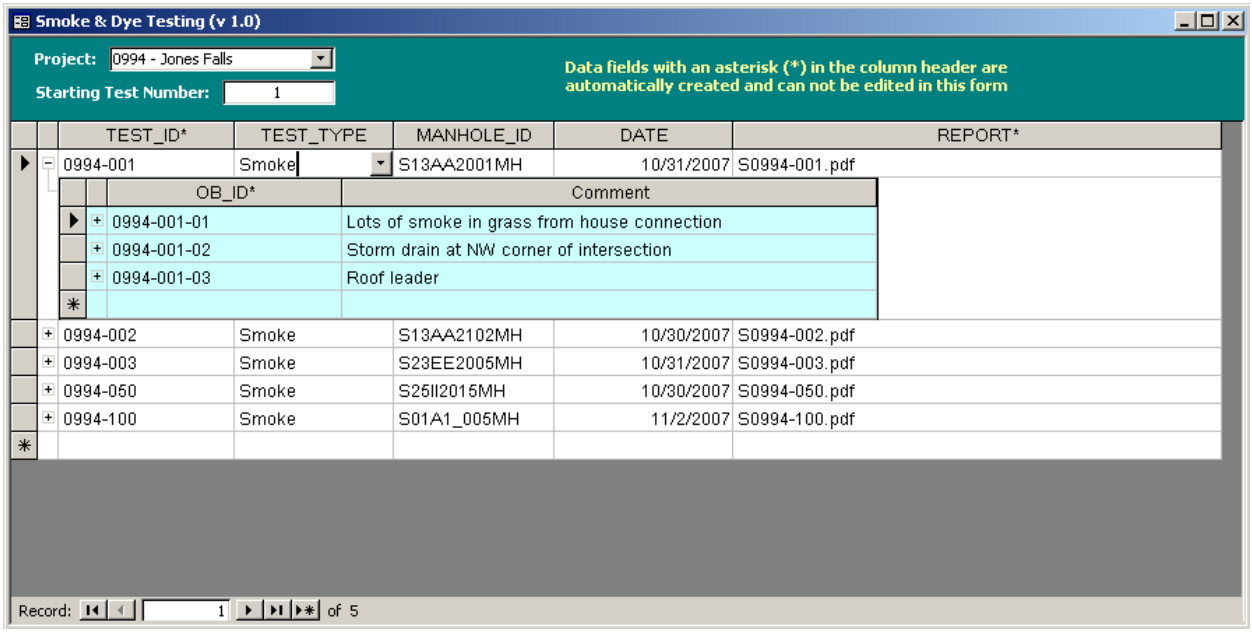


Figure 2 - Observation records

Note: Observation numbers are assigned sequentially by the application by finding the first observation index number available from 1. This means that the application will "backfill" to populate unused numbers.

For example, if observations 1 through 5 are currently in the database for a particular test and observation #3 is deleted. The next observation added to this test will have an ID index of 3.

Adding an Observation Photo Record

Clicking the small plus sign on the left side of the Observation record will open a subform showing all photos for the observation selected, as shown in

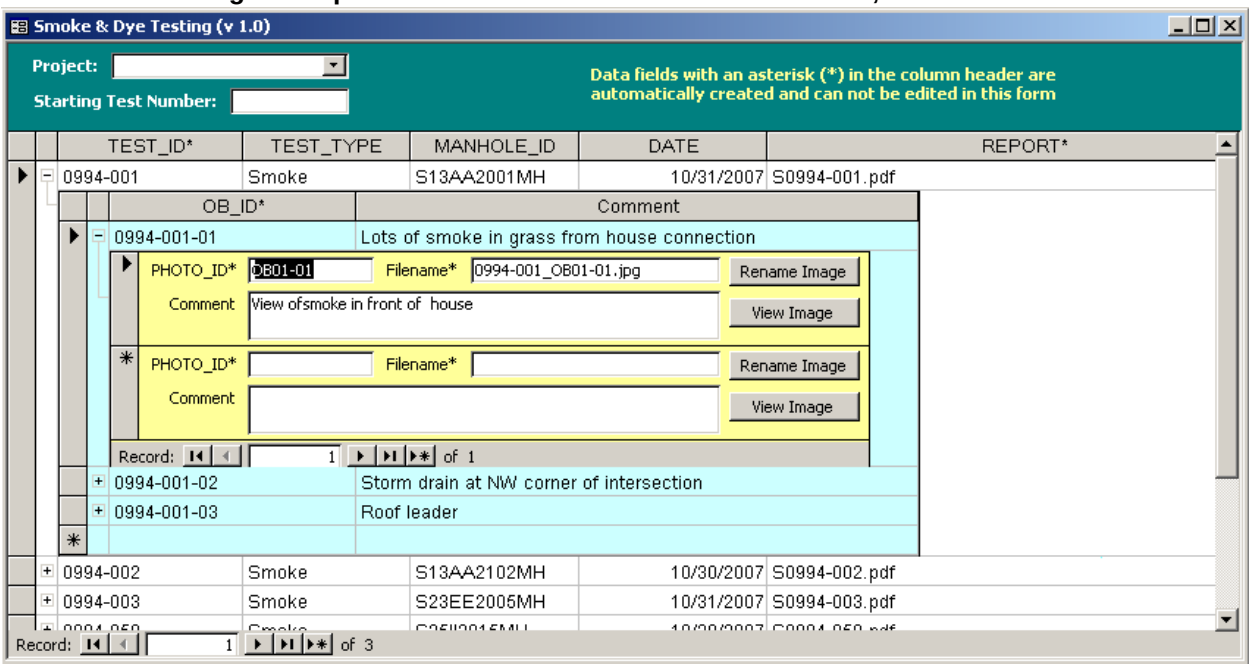


Figure 3 - Observation Photo form

.

Note: The **Comment** field is the only user-editable field in the Photo subform.

To add a new photo, enter a comment, and the PHOTO_ID and Filename fields will automatically populate.

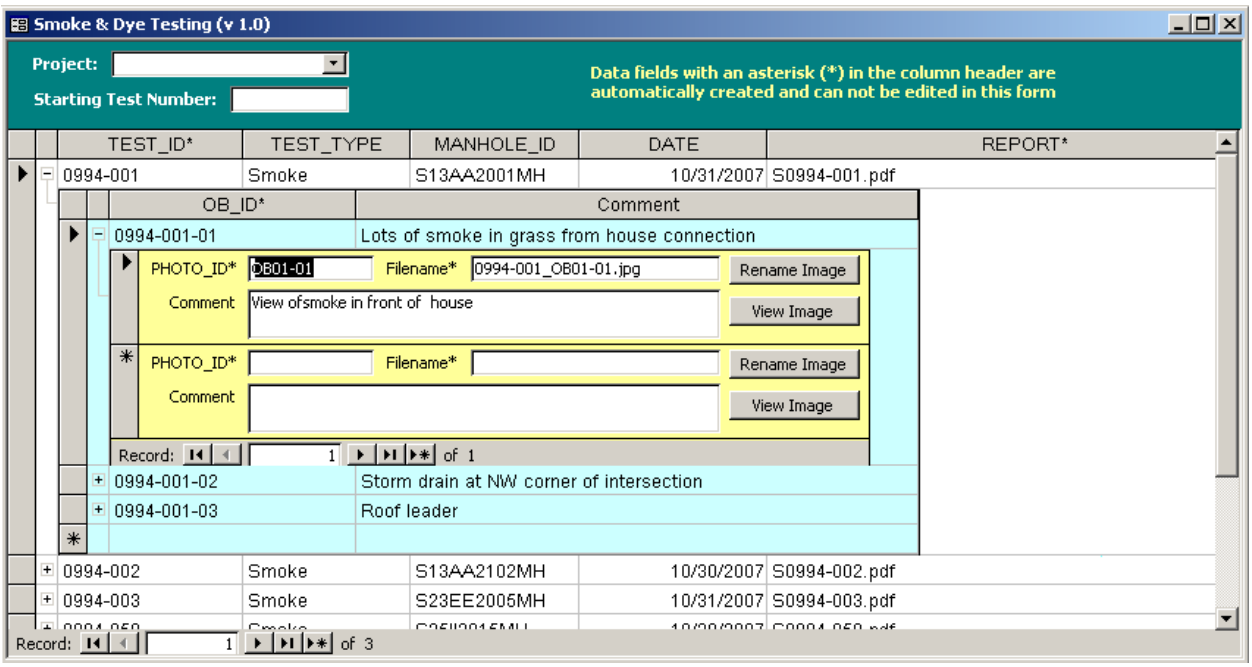


Figure 3 - Observation Photo form

Naming Observation Photo Image Files

The **Rename Image** button can be used to rename photo files to the proper filename as defined in the BaSES specifications. When this button is clicked, a file browser dialog is displayed allowing the user to select the specific image file associated with this observation photo record as shown in Figure 4. Once an image file is selected, the application will properly rename the file so that it is properly linked to the observation photo record.

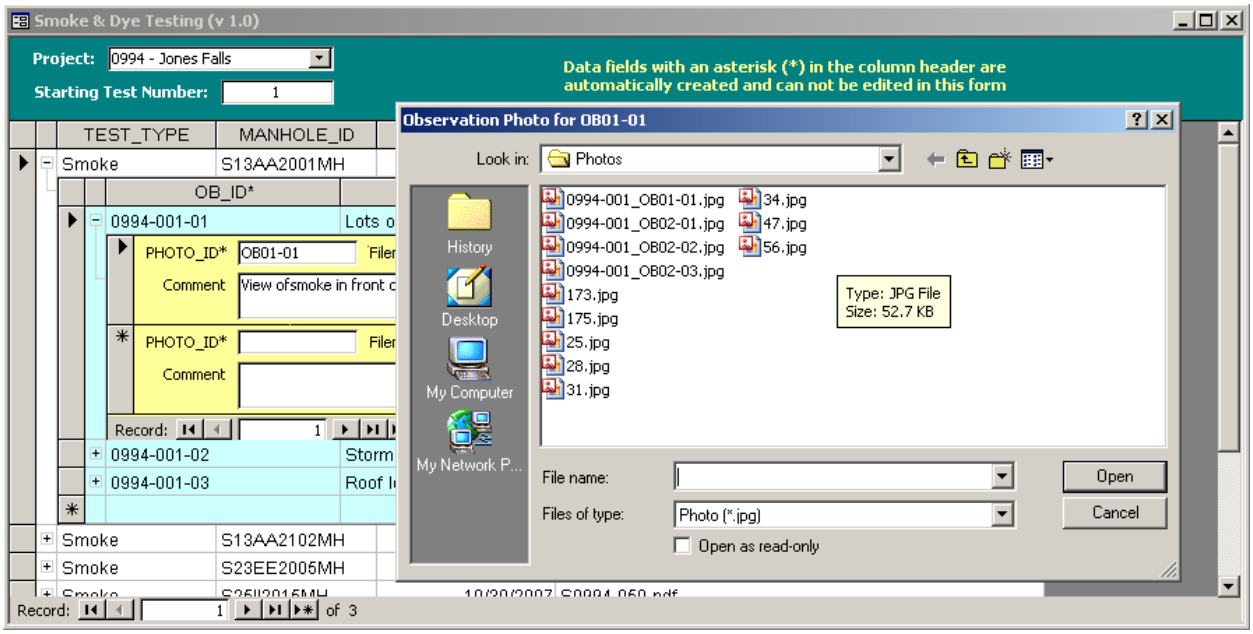


Figure 4 - Selecting a image file to rename

Viewing Observation Photo Images

The **View Image** button can be pressed to review currently select observation photo using the computer's default image viewer.

Renumbering a Test

The Renumber Test button can be used to modify the name of a selected smoke or dye test. In addition to changing the test name, the utility also updates the children observations and photo data database IDs and renames observation photos and report filenames that are currently linked to the database.

Select a test to renumber and press the **Renumber Test** button. The application will display the Renumber Test form as shown in Figure 5. The old test index and ID are display in the upper left corner of the form. You can enter a new index value to be used to create a new test ID.

If the Report Folder and Photo Folder are not populated, press the Browse button and select the folder in which the report or photo files exist. If these folder fields are properly set, the application will automatically rename the external report and observation files associated with the renumbered test.

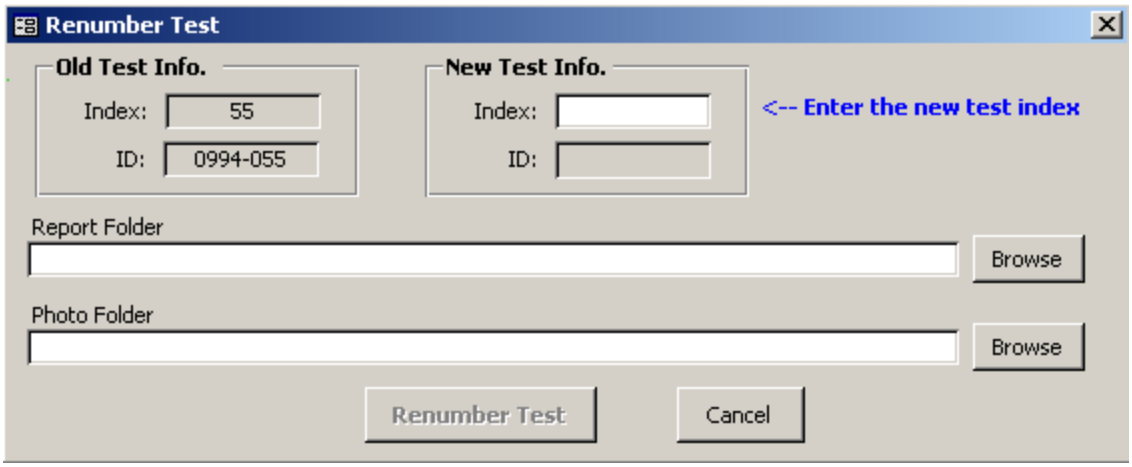


Figure 5 - Renumber Test form

System Prerequisites

The Smoke & Dye testing database requires the following:

- Microsoft Access 2000 or higher
- Microsoft common dialog ActiveX control 6.0 (comdlg32.ocx)

The common dialog ActiveX control is frequently already installed by other application and usually already installed on must computer. The comdlg32.ocx, along with the following files (comdlg32.dll, comdlg32.oca and comdlg32.dep), are located in Window's System32 folder. If they are not present in the System32 folder, perform the following steps to install and register the ActiveX control:

1. Copy the 4 files to this folder
2. Open up a command window
3. Change the active directory to the system32 folder (i.e. **CD C:\Windows\System32**)
4. Type: **regsvr32 comdlg32.ocx**